A STUDY ON ETIOLOGICAL FACTORS AND OUTCOME OF RECTAL PROLAPSE

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CHENNAI

APRIL - 2013

CERTIFICATE

This is to certify that this dissertation titled

"A STUDY ON ETIOLOGICAL FACTORS AND OUTCOME OF RECTAL PROLAPSE"

is the bonafide work done by **Dr. ARAVIND R. M.,** Post Graduate Student (2010 – 2013) in the Department of General Surgery, Govt. Stanley Medical College and Hospital, Chennai under the direct guidance and supervision and in partial fulfilment of the regulations laid down by The Tamil Nadu Dr. M.G.R. Medical University, Chennai for M.S. Branch I, General Surgery Degree Examination to be held in April 2013.

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"A STUDY ON ETIOLOGICAL FACTORS AND OUTCOME OF RECTAL PROLAPSE"

is a bonafide work done by me at Govt. Stanley Medical College and Hospital from May 2010 to Oct 2012 under the guidance and supervision of my unit chief,

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Dr. Aravind. R.M

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LIST OF ABBREVIATIONS

USG	Ultrasonography
CECT	Contrast Enhanced Computed Tomography
MRI	Magnetic Resonance Imaging
PNTML	Pudendal Nerve Terminal Motor Latency
ECG	Electrocardiogram
ADD	Acute Diarrhoeal Disease

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INTRODUCTION

Rectal prolapse is a condition characterized by protrusion of a part or whole of the rectum through the anus.

"The search for a single common theory for the cause of rectal prolapse has not been fruitful"

"The precipitating factors in the development of rectal prolapse have not been completely understood. Various theories have been put forth to explain the cause(s) of prolapse".

The above two statements give a clear picture about how rectal prolapse is still a mystery to a surgeon. Numerous theories have been proposed to explain the mechanism in which rectal prolapse develops but none of them comprehensively explain the mechanism in all the various scenarios.

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When it comes to the investigations required, it ranges from simple proctoscopy to complicated procedures like dynamic pelvic floor MRI & cinedefecography. In many of the previous studies, majority of the patients had normal findings in all the investigations.

Finally if we look on the treatment options available, about 130 or more surgeries described for rectal prolapse alone also shows the poor understanding of the disease process.

REVIEW OF LITERATURE

HISTORICAL OVERVIEW OF RECTAL PROLAPSE:

- Described 3500 years ago in the Ebers Papyrus[1]. One of the Coptic mummies from 400-500 B.C. was found to have rectal prolapse.

FIGURE 1: COPTIC MUMMY WITH RECTAL PROLAPSE

- Honey suppositories were suggested as one means of treatment by the Egyptians.
- Hippocratic Corpus (400 B.C.) describes a technique for the management of prolapse. “Start by hanging the affected individual by their heels, Shake the patient until the gut returns to the body cavity. Caustic potass is then applied to the rectum and thighs are bound together for three days”
- Riolanus (1598) and Fabricus ab Aquapendente (1648) both described a method in which anus is burnt which causes a scar which in turn prevents rectal prolapse.
- In 1617 Woodall reported that he was able to successfully treat rectal prolapse with an alternative method: Apply powdered dog dung to the prolapsed rectum. The key was that the dog who provided the specimen had been fed bones
- Parey (1634) proposed that rectal prolapse occurred due to sitting on cold rocks and not keeping one’s bottom warm. Thus, he proposed wearing breeches.
- Wiseman (1676) described carving two sticks in such a way that they would avoid the rectum from prolapse in the act of defecation.
- Salmon studied rectal prolapse extensively (1800s) and at one point advocated placing leeches at the anal orifice.

- The pathophysiology underlying rectal prolapse remained poorly understood in the sixteenth century, largely because of lack of accurate anatomic knowledge. After **Vesalius in 1543** published a detailed description of the anorectum and its surrounding muscular support, it was suggested that the underlying mechanism was a weakness of the levator ani, the anal sphincter or both.
- In **1889 Mikulicz** first introduced the perineal procedure of amputation of the rectal prolapse from below known as “Rectosigmoidectomy” which was coined by **Miles** in 1933 and used by Gabriel to treat patients.
- In **1942 Roscoe Graham** recommended an abdominal approach to mobilize the rectum, following which the levator muscles are exposed and suturedanterior to the rectum and remove the deep pouch of Douglas.
- In **1947 Orr** – introduced rectopexy with using fascia lata in two strips or mesh made of nylon.
- In **1948 – Dunphy** incorporated rectosigmoidectomy in the perineal phase.
- In **1955 – Wells** of Liverpool advocated rectopexy using polyvinyl – alcohol (Ivalon) sponge wrap which is very popular in the United Kingdom.
- In **1955 – Muir** introduced close fixation of rectum to sacrum after anterior resection.

- In the eighteenth century, surgeons such as **Morgagni, Vonhall,** and **Hunter** suggested that rectal prolapse was an intussusception of the colon – a view that was the precursor of the modern theory. **Moschcowitz**, in the early twentieth century introduced the idea that prolapse was originally a sliding perineal hernia, based on the observation that many with prolapse have a deep cul-de-sac[2]. This above concept provided the basis for his repair and for modifications still used today.
- Ripstein espoused this theory as recently as 1963, also noting the loss of the curvature of the rectum posteriorly[3]. He suggested that laxity of the suspensory ligaments, allowing anterior rectal displacement, was congenital in young patients and acquired in older ones.
- In **1962 Jenkins and Thomas** developed technique for repair of complete rectal prolapse through a sacral or kraske type of approach.
- In **1965 – Ripstein** devised a method of rectopexy using Teflon mesh. The technique being similar in principle to the polyvinyl alcohol sponge operation. This operation has become very popular in United States.
- In **1980 Atri S.P.** introduced graciloplasty.
- In **1981 Fergusson EF, Houston CH** gave a preliminary report of a new method of omental pedicle graft rectopexy for rectal procidentia. **Keighley et al (1983)** in their series of 100 cases of abdominal rectopexy using polypropylene (Marlex) mesh reported no recurrence and no mortality[4].
- Till date there are more than 130 procedures described for rectal prolapse repair.

ANATOMY OF RECTUM AND ANAL CANAL[5, 6]

EMBRYOLOGY[9]:

Rectum is derived from the primitive hindgut. The proximal anal canal lining derives from hindgut endoderm and the distal portion from ectoderm. Early in embryologic life, the gastrointestinal tract (terminal portion of the hindgut) and urinary tract (allantois) empty into a common endoderm lined cavity, the cloaca, which is bound ventrally by the cloacal membrane. A urogenital septum develops between the allantois and hindgut and descends caudally to divide the cloaca into primitive urogenital sinus in front and anorectal canal behind. By 7 weeks, the septum reaches the cloacal membrane and divides into a posterior anal membrane and an anterior urogenital membrane. An ectodermal depression (anal pit or proctodeum) forms in the anal membrane and migrates dorsally towards the rectum. It eventually fuses with it to establish continuity between the rectum and the outside.

SURGICAL ANATOMY[5, 6, 7, 8, 9]

RECTUM:

The rectum is situated in the posterior part of the lesser pelvis in front of lower 3 sacral vertebrae and coccyx.

It begins as a continuation of sigmoid colon at the level of S3 vertebra (indicated by lower end of sigmoid mesocolon) and ends by becoming continuous with anal canal at the anorectal junction (2-3 cm in front of and below the tip of coccyx, corresponds to apex of prostate in males).

It is about 12 cm long (5inches). In the upper part it has the same diameter as sigmoid colon (4cm), but in the lower part it is dilated to form rectal ampulla.

Rectum runs downwards & backwards first, then downwards and then downwards & forwards. It shows two types of curvatures:

a. **Two antero-posterior curves :**
    1. **Sacral flexure**, follows concavity of sacrum & coccyx
    2. **Perineal flexure**, backward bend at the anorectal junction
b. **Three lateral curves:**
    1. **Upper lateral**, convex to right
    2. **Middle lateral**, convex to left (most prominent)
    3. **Lower lateral**, convex to right

Mucosal folds:

The mucous membrane of empty rectum shows two types of rectal folds, longitudinal and transverse.

1. **Longitudinal folds** are transitory. They are present in lower part of empty rectum and obliterate after distension

2. **Transverse or horizontal folds*(Houston's valves or plicae transversalis):***

   They are permanent and most marked when rectum is distended.

   a. **Upper fold** lies near upper part of rectum and projects from right or left wall
   b. **Middle fold** (largest & most consistent) lies at the upper end of rectal ampulla and projects from anterior and right walls
   c. **Lowest fold** may be present 2.5cm below the middle fold and projects from left wall
   d. **Fourth fold** may be present on the left wall 2.5cm above the middle fold.

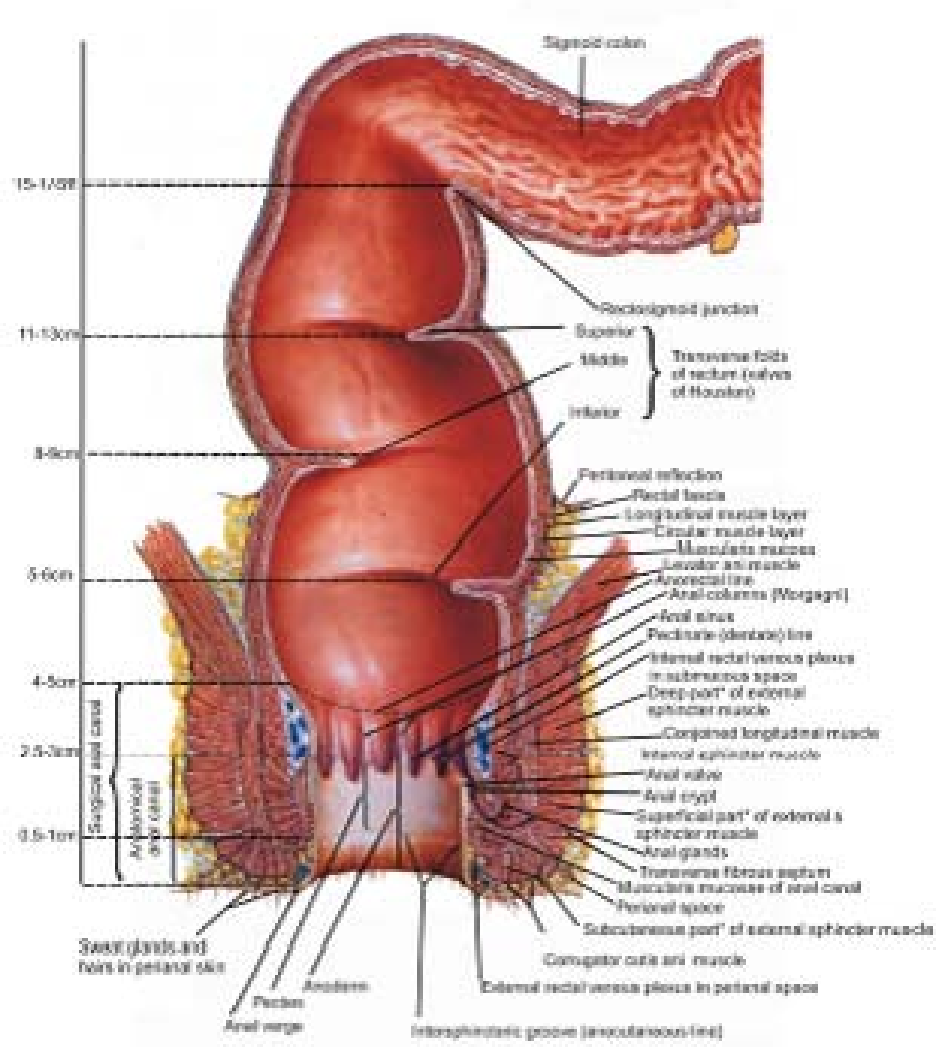


FIGURE 2: ANATOMY OF RECTUM AND ANAL CANAL

The above picture shows the internal structure of the rectum and anal canal with the presence of the transverse folds which are permanent and also the presence of the lateral curvatures.

Arterial supply:

1. Superior rectal artery:

   This is the chief artery of rectum. It is the continuation of inferior mesenteric artery. It bifurcates at the level of S3 vertebra into right and left branches. Each branch divides into multiple branches which enter the muscular coat and traverse the anal columns up to the anal valves and form looped anastomosis.

2. Middle rectal artery:

   They supply only the superficial coats of the rectum. They arise from the anterior division of internal iliac artery, run in lateral ligaments of the rectum and supply muscular layer of caudal portion of rectum.

3. Median sacral artery:

   This is a small branch of aorta arising near its lower end. It supplies posterior part of anorectal junction.

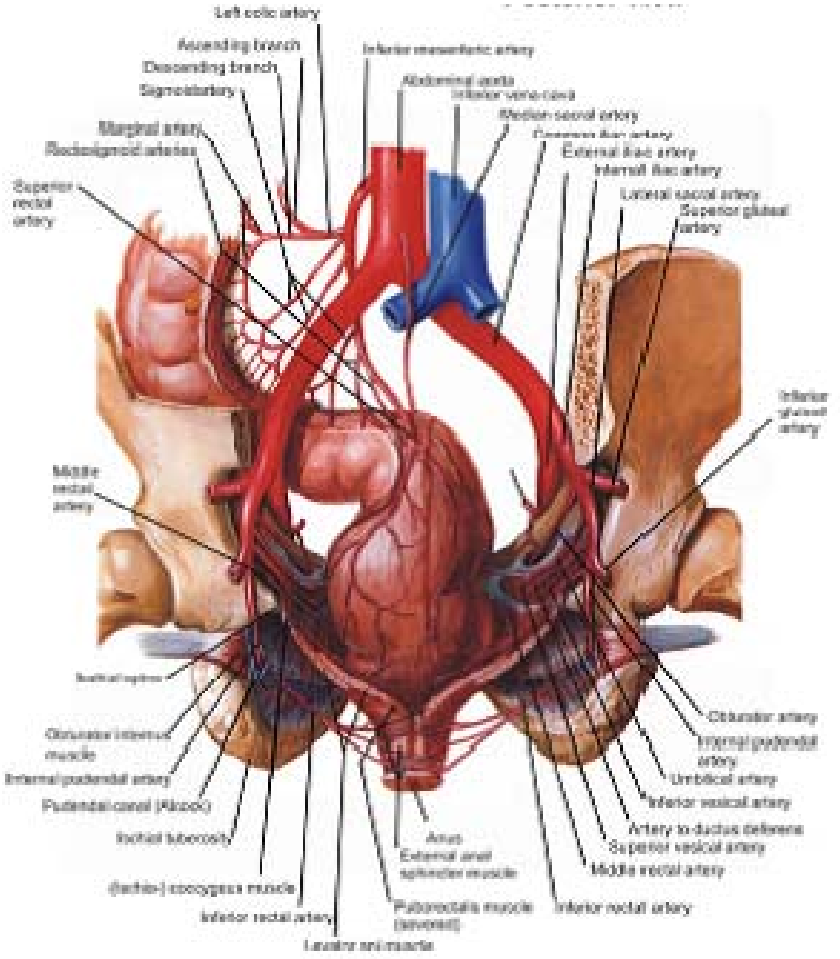


FIGURE 3: ARTERIES OF RECTUM AND ANAL CANAL

Arterial supply of rectum is derived from both portal and systemic circulation. The lower end of rectum is an important site of porto-systemic anastomosis.

Venous drainage:

1. Superior rectal vein:

   The tributaries of this vein begin in the anal canal and traverse through the rectal submucosa, enter the muscular coat, 7cm above anus and join to form superior rectal vein which continues as inferior mesenteric vein.

2. Middle rectal veins:

   They drain the muscular layer of the rectal ampulla and drain into internal iliac veins.

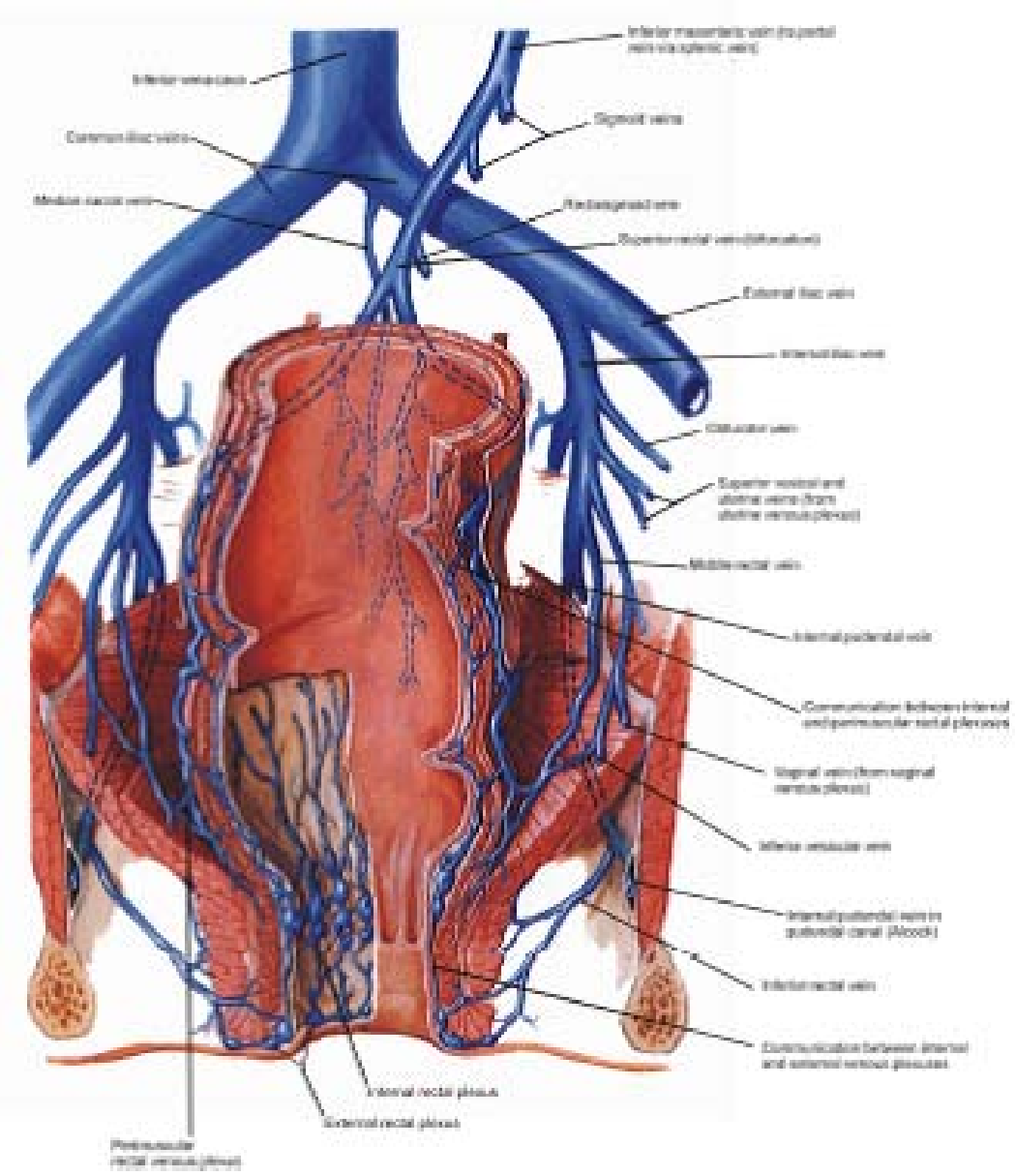


FIGURE 4: VEINS OF RECTUM AND ANAL CANAL

Venous drainage from the rectum is mainly carried into the inferior mesenteric vein via the superior rectal vein, while some of the venous blood drains into the internal iliac veins via the middle rectal vein.

Lymphatic drainage:

1. Lymphatics from upper half of rectum pass through the lymphatics of the superior rectal vessels to inferior mesenteric nodes after passing through pararectal and sigmoid nodes.
2. Lymphatics from inferior half of rectum pass along middle rectal vessels into the internal iliac nodes.

Nerve supply:

Sympathetic (L1,2) and parasympathetic (S2,3,4) nerves supply the rectum through the superior rectal (inferior mesenteric) and inferior hypogastric plexus.

Sympathetic nerves are vasoconstrictor, relax the rectal musculature and constrict the internal sphincter. Parasympathetic nerves cause contraction of rectal muscles and relax the internal sphincter.

Parasympathetic nerves sense the distension of rectum whereas sympathetic as well as parasympathetic nerves detect the pain sensation.

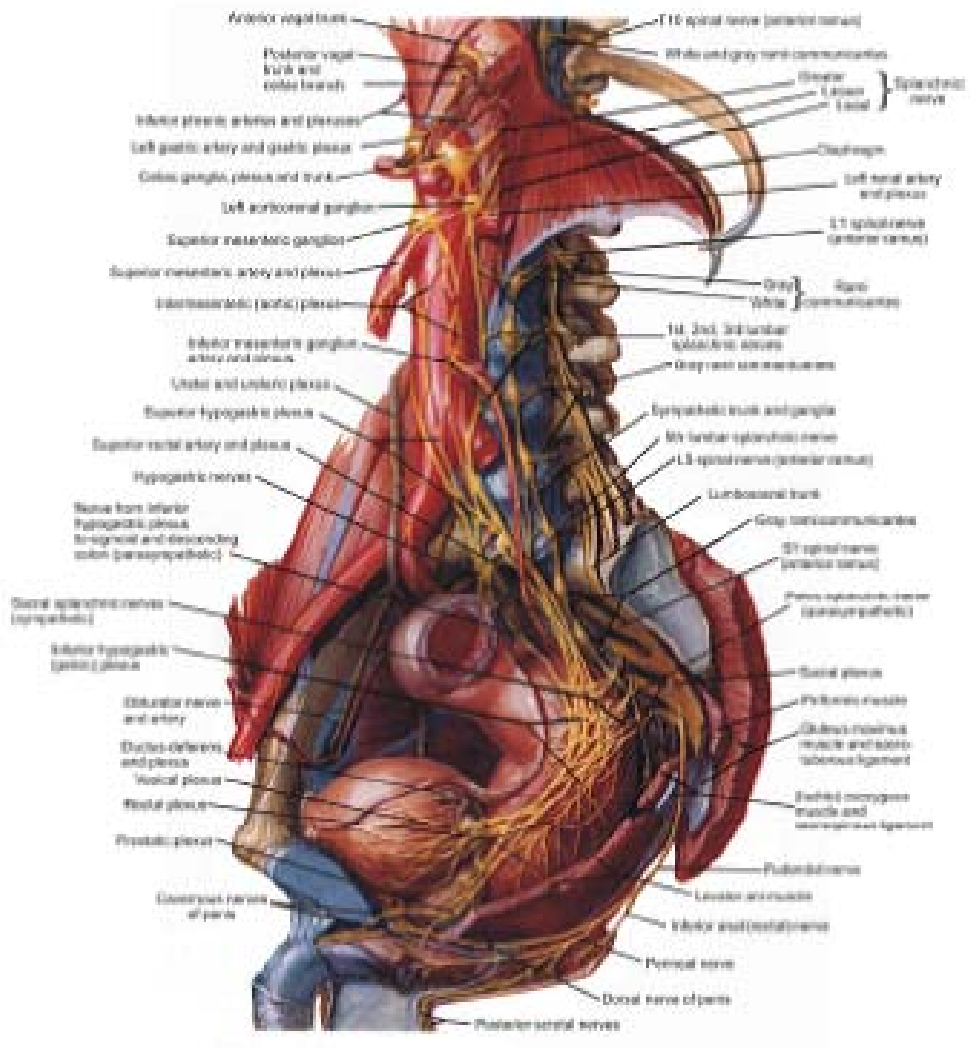


FIGURE 5: NERVE SUPPLY OF RECTUM AND ANAL CANAL

Rectum receives its nerve supply from the autonomic nervous system via superior rectal and inferior hypogastric plexus.

Supports of rectum:

1. Pelvic floor
2. Fascia of Waldeyer:

   It fixes the inferior part of rectal ampulla to sacrum. It is formed by condensation of pelvic fascia behind rectum. They enclose superior rectal artery and vein and lymphatics.

3. Lateral ligaments of rectum:

   They arise due to condensation of pelvic fascia on both the sides of rectum. They attach rectum to posterolateral walls of pelvis. The middle rectal artery and vein and nerve branches of pelvic plexus are present in them.

4. Denonvilliers fascia:

   It is nothing but rectovesical fascia which is attached between rectum posteriorly to the seminal vesicles & prostate anteriorly.

5. The pelvic peritoneum and the associated vascular pedicles help to keep rectum in position.

ANAL CANAL:

Anal canal is the last part of the large intestine, present inferior to the pelvic diaphragm. It lies between the two ischiorectal fossae occupying the perineum.

It is about 3.8 – 4 cm long, extends from the anorectal junction to anus and is directed downwards and backwards.

The anorectal junction is marked by the forward convexity of perineal flexure of rectum and lies 2-3cm in front of and slightly below the tip of coccyx. Here rectal ampulla suddenly narrows and pierces the pelvic diaphragm. In males, it corresponds to the apex of prostate.

The anus is the surface opening of the anal canal, situated about 4cm below and in front of tip of coccyx. The surrounding skin is pigmented and thrown into radiating folds and contains ring of apocrine glands.

Interior of anal canal:

Anal canal is divided into three parts.

1. **Upper part(mucous)**:

   This is about is 15mm long. It is lined by mucous membrane and is of endodermal origin. The mucous membrane shows 7-10 vertical folds called as ***anal columns (of Morgagni)***. The caudal ends of the anal columns are joined to each other by short transverse valves called as ***anal valves***. Just cranial to each valve there is a pit called as ***anal sinus***. The anal valves coalesce to form a horizontal line called as ***pectinate line*.**

2. **Middle part (transitional zone or pectin):**

   It is about 15mm long, mucous membrane forms the lining but anal columns are absent. The mucosa is less mobile than in the upper part and it is bluish in appearance because of dense venous plexus between mucosa and muscle coat. The lower limit of this zone has a whitish appearance which is referred as ***white line of Hilton.***

3. **Lower part (cutaneous):**

   It is about 8-10 mm long and is lined by skin with sweat and sebaceous glands.

   The epithelium of upper part is columnar, middle part is stratified squamous (without sebaceous or sweat glands) and lower part is lined by true skin.

Musculature of anal canal:

A. Anal sphincters:

1. Internal anal sphincter:

It is involuntary in nature and is formed by the thickened circular muscle layer (continues from rectum). It surrounds the upper three fourths of anal canal up to the white line of Hilton.

2. External anal sphincter:

It is voluntary in nature and is formed by striated muscle and innervated by inferior rectal nerve and fourth sacral nerve (perineal branch). It has got three parts.

a. Subcutaneous part:

It lies below the level of internal sphincter and surrounds the lower part of anal canal. It is the form of a flat band, 15mm broad and has no bony attachment.

b. Superficial part:

It is elliptical in shape and arises from the terminal segment of coccyx as the anococcygeal ligament. The fibres surround the internal sphincter and are attached to the perineal body.

c. Deep part:

It surrounds the upper part of internal sphincter and fused with puborectalis. It arises from anococcygeal ligament and inserted to perineal body.

B. **Conjoint longitudinal coat:**

It is formed by fusion of puborectalis with longitudinal muscle coat of rectum at the anorectal junction. It lies between external and internal sphincters.

C. **Anorectal ring:**

It is a muscular ring present at the anorectal junction. It is formed by the fusion of puborectalis, deep external sphincter and internal sphincter. Surgical division of this ring results in rectal incontinence.

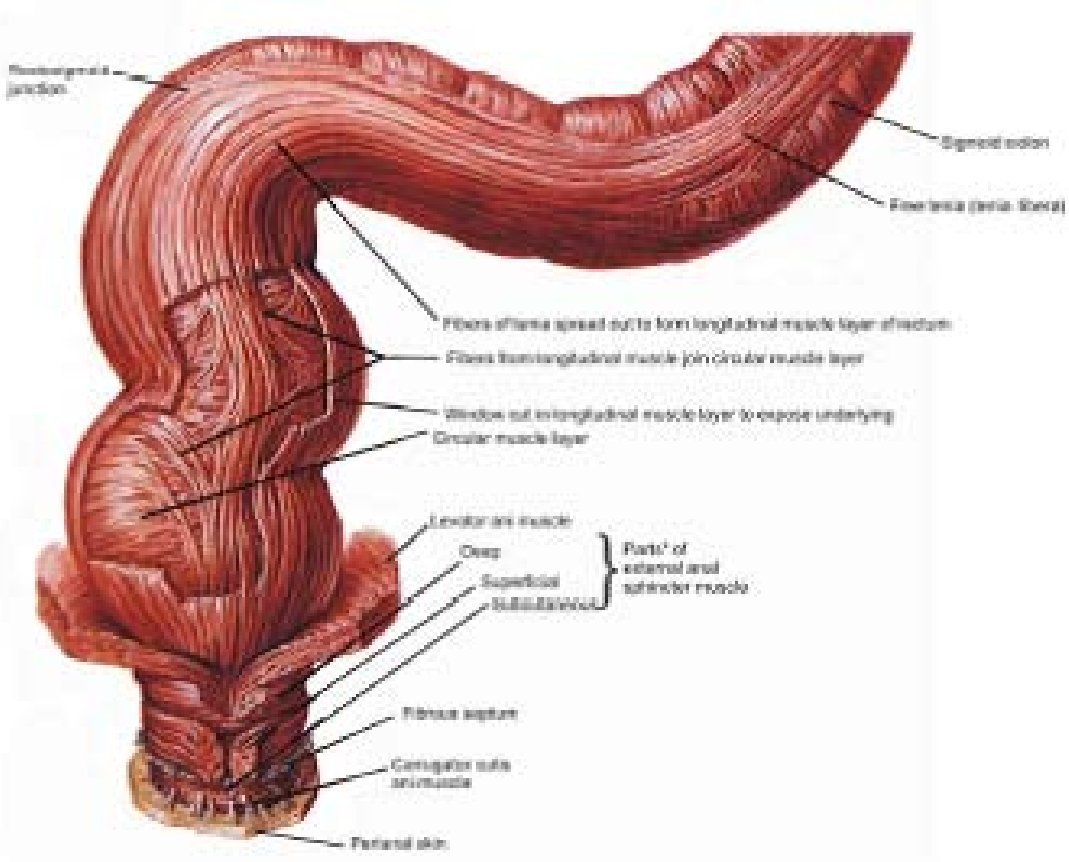


FIGURE 6: MUSCULATURE OF RECTUM AND ANAL CANAL

The above picture shows the arrangement of various muscles of the rectum.

It is clearly visible that the internal sphincter of rectum is the continuation of the circular muscle layer of the sigmoid colon.

Arterial supply:

1. The part superior to the pectinate line is supplied by superior rectal artery.
2. Part inferior the pectinate line is supplied by inferior rectal artery.

Venous drainage:

1. Internal rectal venous plexus (hemorrhoidal plexus):

   It is present in the submucosal layer of anal canal and joins the superior rectal vein but it communicates with the middle and inferior rectal veins via communication with the external venous plexus. Thus it is one of the sites of porto-systemic shunts.
2. External rectal venous plexus:

   It is present outside the muscularis layer of rectum and anal canal. Lower part of external plexus is drained by inferior rectal vein into internal pudendal vein, middle part by middle rectal vein into internal iliac vein and upper part into superior rectal vein.

Lymphatic drainage:

Above the pectinate line, they drain into internal iliac nodes and portion inferior to the pectinate line drains into the superficial inguinal nodes (medial group).

Nerve supply:

1. Above pectinate line, the anal canal is supplied by autonomic nerves, both Inferior hypogastric plexus supplying the sympathetic fibres (L1, 2) and pelvic splanchnic nerves supplying the parasympathetic fibres (S 2, 3, 4)
2. Below the pectinate line, it is supplied by inferior rectal nerves (somatic; S2, 3, 4)
3. Sphincters: Sympathetic nerves cause constriction of internal sphincter whereas relaxation of internal sphincter is brought about by parasympathetic nerves. External sphincter is voluntary and is supplied by somatic nerves (inferior rectal nerve and perineal branch of fourth sacral nerve).

RECTAL PROLAPSE[10, 11, 12]

Rectal prolapse is protrusion of a part or whole rectum through the anal orifice.

Incidence:

Rectal prolapse is a rare disorder, more common in the elderly population. The condition is usually associated with pelvic floor descent and prolapse of other pelvic floor organs, such as the uterine prolapse or cystocele.

Rectal prolapse can be seen in any age group, but the most common age of presentation is 4^{th} to 6^{th} decade of life[13].

Pediatric population is less commonly affected. If present, it is more common in the age less than 3 years, maximum incidence being reported in the first year of life. Most common type in pediatric population is a partial mucosal prolapse, the reason being poor fixation of rectal mucosa to the underlying submucosa.

The incidence of prolapsed rectum in children with cystic fibrosis approaches 20%[14].

According to western studies, rectal prolapse is predominantly seen in female population with the female-to-male ratio of 6:1.

Etiology:

The exact etiological factors of rectal prolapse are not defined; but a number of abnormalities have been identified to be associated with rectal prolpase. Etiologic factors may be congenital or acquired. More than half of the patients are associated with chronic straining with defecation and constipation. Various anatomic and physiologic abnormalities are proposed to cause rectal prolapse.

Anatomic abnormalities:

- Deep cul-de-sac
- Redundant sigmoid colon
- Poor sacral fixation
- Lax in the lateral ligaments

Physiologic abnormalities:

- Atonic levator ani muscles
- External anal sphincter weakness
- Non-relaxing puborectalis
- Pudendal nerve injury

Other predisposing conditions include the following:

- Pregnancy
- Previous surgery
- Pelvic muscle dysfunction
- Neurologic disorders - Previous lower back or pelvic trauma/lumbar disk disease, cauda equina syndrome, spinal tumors, multiple sclerosis
- Disordered defecation (eg: stool withholding)

The cause of rectal prolapse in children is due to:

- Relative straight course of the rectum,
- Weakly developed pelvic floor muscle,
- Poor fixation of mucosa to the sub mucosa,
- Laxity of the mucosa of rectum.

Pathophysiology of rectal prolapse:

The pathophysiology of rectal prolapse remains a matter of debate. Various theories have been proposed stating the probable mechanism of rectal prolapse.

In 1912, **Moschowitz**[2] identified that there ctovaginal pouch was abnormally deep in patients who developed rectal prolapse and proposed the theory that rectal prolapse is basically a sliding hernia in which the anterior rectal wall is herniated into the defect of the levator ani. So, he proposed a treatment modality involving the closure of the weakness in the levator ani muscle and obliteration of Douglas pouch. This carried a very high recurrence rates and is not advocated anymore.

In 1968**, Broden** and **Snallmann**[15]**,** with the help of cinedefecography showed that rectal intussusception is the mechanism behind the development of rectal prolapse.

In 1970, **Theuerkauf et al.,** [16]proved this theory by using X-rays taken using radioisotope which are applied over the rectal mucosa.

The theory of rectal intussusception states that the rectal mucosa, 7-9 cm from the anal verge, telescopes into the distal rectum. The telescoping increases in subsequent days due to excessive straining, finally leading to complete prolapse. This is the most common accepted theory for rectal prolapse.

Shorvon et al., [17] tried to disprove the theory of intussusception by showing that more than 50% of normal individuals have telescoping of rectum on cinedefecography.

Mellgren et al.,[18] in their study proposed rectal prolapse may not develop in all the patients with internal intussusception.

In addition, **Parks et al.,**[19] suggested the theory of pudendal nerve injury. In 1977, patients undergoing surgery for fecal incontinence and rectal prolapse were subjected to pelvic floor biopsy and proved pudendal nerve injury by histological examination. According to the study, pelvic floor weakness was the main mechanism behind the development of rectal prolapse.

Pudendal nerve injury might occur due to descent of the pelvic floor, vaginal delivery, or excessive straining during defecation.

In patients with prolapse without incontinence, anal sphincter electromyogram shows no injury to pudendal nerve. This theory of pudendal nerve injury in rectal prolapse holds good only for patients of rectal prolapse with associated incontinence.

The pathophysiology and etiology of mucosal prolapse most likely differ from those of complete rectal prolapse and internal intussusception. Partial rectal prolapse occurs when the loose areolar tissue attachments of the rectal mucosa to the submucosa are weak, thus allowing the tissue to prolapse through the anus. This usually occurs in association with long-standing hemorrhoids.

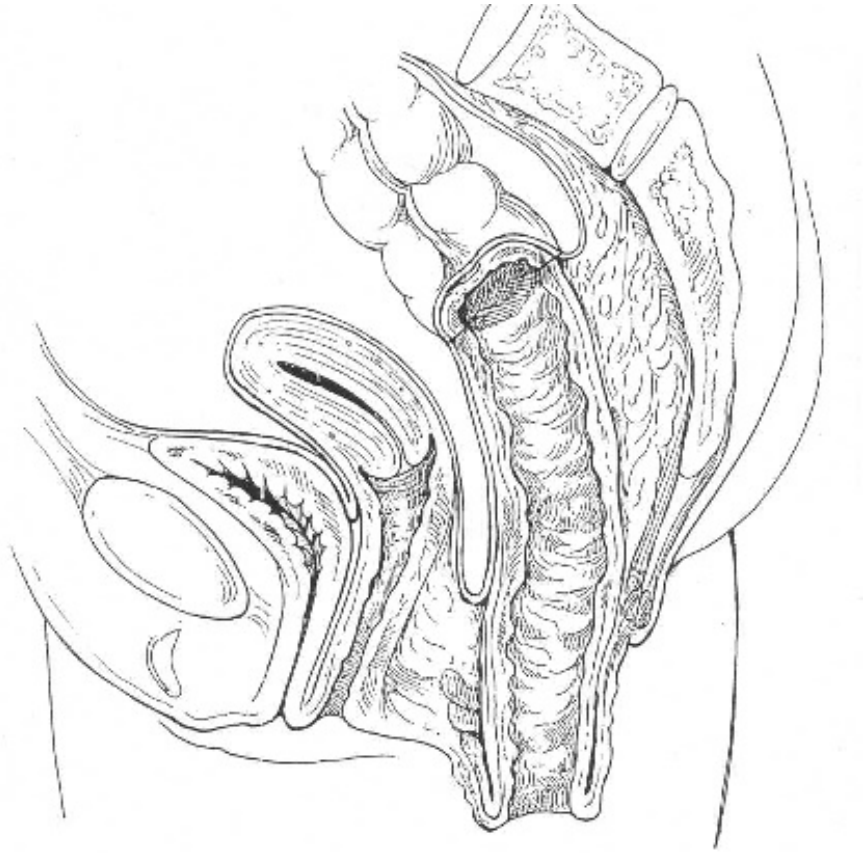


FIGURE 7: SAGGITAL CROSS SECTION OF COMPLETE RECTAL PROLAPSE

CLASSIFICATION OF RECTAL PROLAPSE

A) Based on clinical presentation:

1. Reducible prolapse
2. Irreducible prolapse
3. Obstructed or incarcerated prolapse
4. Strangulated prolapse

Reducible prolapse: It is the commonest type. Prolapsed rectum reduces either on its own or by manipulation. It reappears during any type of straining.

Irreducible prolapse: The prolapsed rectum cannot be reduced even by manipulation. It may be due to adhesions.

Obstructed/ incarcerated prolapse: It is nothing but irreducible prolapse with features of intestinal obstruction.

Strangulated prolapse: Irreducible prolapse with features of strangulation of prolapsed segment.

B) Anatomical classification:

1. Mucosal or partial prolapse
2. Internal prolapse
3. External prolapse/ complete rectal prolapse/ procidentia

Mucosal prolapse: Only the mucosal layer of the rectum prolapses through the anal orifice with underlying rectal musculature in situ.

Internal prolapse: In this type, upper portion of rectum prolapses into the distal rectum but not beyond the anal verge. It eventually becomes complete prolapse.

Complete prolapse: It is the full thickness prolapse of the rectum beyond the anal verge. It is also called as procidentia.

CLINICAL FEATURES

Symptoms:

- Mass protruding through the anus during or after defecation.
- Anal Bleeding
- Difficulty with evacuation, feeling of incomplete evacuation
- Tenesmus or rectal pain during or after defecation
- Dragging pain in the pelvic regions and low backache
- Fecal incontinence
- Mucus discharge (soiling of underpants)
- Constipation

Initially patients usually notice a small mass which protrudes out of the anal orifice during straining at stools or coughing which reduces on its own or by manipulation. Later on the mass progressively increases in size and patients will have difficulty in doing day to day activities and it also leads to soiling of undergarments, bed linen which leads to psychological disturbance.

Bleeding is mainly due to repeated trauma.

Rarely patients present with long standing prolapse present with features of obstruction or strangulation.

Signs:

- Length of prolapse is usually 8 – 10cm in complete prolapse whereas it is less than 4 cm in partial mucosal prolapse
- Circular folds of mucosa on the prolapsed rectum.
- Presence of a groove between the rectum and the anus
- Presence of a Solitary rectal ulcer is seen in 5-30% of patients
- Sphincter tone is reduced
- Examination reveals a patulous anus through which the rectum prolapses.
- On palpation the presence of all the layers of the rectal wall are noted.

EVALUATION

Rectal prolapse is essentially a clinical diagnosis. Investigations are required only to detect the etiology and to rule out co-existing colonic pathologies.

Colonoscopy: Before considering surgical intervention, assessment of the full colon is necessary. During colonoscopy, one should look for redundant sigmoid, identify lead point, evaluate colonic mucosa, rule out additional pathology, such as a neoplasm which may be causing the prolapse.

Barium enema: Redundant rectum is better seen in barium enema.

Patients with constipation should undergo **colonic transit studies**. This involves having the patient ingest 24 radiopaque markers. Sequential daily films are performed to assess movement of the markers. Patients with total colonic inertia will retain at least 80% of the markers after five days.

Anorectal manometry & pudendal nerve terminal motor latency (PNTML) should be considered in rectal prolapse with fecal incontinence.

Video Defecography: Video defecography helps to differentiate between mucosal prolapse from complete prolapse. It also helps in identification of internal intussusception of rectum It is not necessary for clinically diagnosed full-thickness rectal prolapse.

Contrast medium (usually barium) is filled into the rectum, and the patient is asked to pass stools on a radiolucent toilet. Films are taken immediately and the defecation can be recorded into videos to detect the internal prolapse.

Additional modalities include:

- **Dynamic pelvic floor MRI**
- **Endorectal ultrasound**

TREATMENT

There are over 130 described procedures in the literature for the correction of rectal prolapse. The primary dilemma is whether to choose perineal or abdominal or laproscopic approaches.

Choice of the procedure:

Various factors should be considered before choosing a particular surgery for a patient.

- Risk of surgery & anaesthesia.
- Perineal or abdominal based on the patient condition and risk
- Functional aspects like fecal incontinence or constipation.
- Preference of surgeon for a particular type of surgery
- Open or laparoscopic in case of abdominal approach.

VARIOUS SURGICAL PROCEDURES FOR RECTAL PROLAPSE

	Author (year)	**Procedure**
A) Transabdominal		
Pelvic floor reconstruction	Moschcowitz (1912)	Douglas closure
	Graham (1942)	Anterior levatoropexy
	Goligher (1970)	Anterior & posterior Levatoropexy
	Sullivan (1990)	Total pelvic mesh repair
Anterior fixation	Pemberton (1937)	Sigmoidopexy
	Ripstein (1952)	Anterior Teflon sling
	Nigro (1958)	Ventral Teflon sling
Posterior fixation	Wells (1959)	Ivalon sling
	Sudeck (1923)	Suture rectopexy
Resection	Muir (1962)	Anterior resection
	Frykman (1969)	Sigmoid resection & Rectopexy
B) Perineal		
	Thiersch (1891)	Perineal sling
	Delorme (1900)	Mucosal sleeve resection
	Altemeier (1971)	Rectosigmoidectomy
	Thomas (1975)	Suture rectopexy

Perineal approach:

Perineal approach for the repair of rectal prolapse was the preferred route in the early part of 20th century.

In 1891, Thiersch, from Germany, proposed an encirclement procedure, in which a prosthesis is encircled around the anus, leading to the narrowing of anal opening.

In 1900, Delorme from France suggested a procedure involving the resection of the rectal mucosa followed by the plication of the muscularis layer.

Mickulicz developed the method of perineal rectosigmoidectomy for the first time in 1889 and was subsequently improved by Miles in 1933 and by Gabriel et al. in 1948; it was popularised in 1971 by Altemeier.

- **Thiersch procedure[20]:** This is the preferred method in old age patients and in patients with high risk for surgery. It involves using a prothesis that narrows the anal opening. Thiersch initially used silver wire as prosthesis but in present day, sutures, nylon, dacron, silicon rubber and other silastic materials are used. Relapse rate is about 30 – 50 % in various literatures. Presently it is used in combination with other procedures.

- **Delorme's procedure (Mucosal sleeve resection)[21]:** Best used for mucosal prolapse alone and in elderly patients. Procedure consists of resection of redundant prolapsed mucosa followed by plication of the exposed rectal muscle followed by suturing of the anorectal mucosal ends. Since the redundant colon is not resected nor fixed to the sacrum, recurrence rate is high. It ranges from 4 – 38% in various studies.

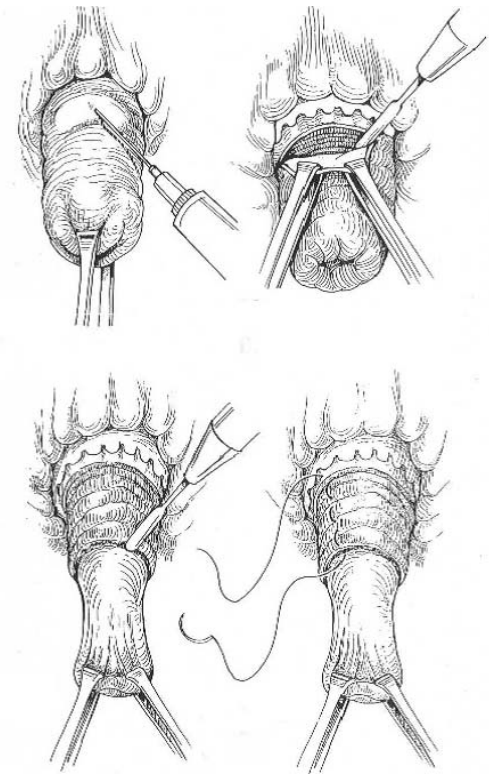


FIGURE 8: DELORME'S PROCEDURE

- **Perineal rectosigmoidectomy:** First described by Mickulicz in 1889. It had support in the first half of the 20th century, but fell out of favor in the 1950s with the onset of trans-abdominal approaches. In 1971, **Altemeier et al[22]** published results showing favorable outcomes (3 recurrences in 106 patients).It has subsequently been referred to as the **Altemeier procedure.** Recurrence rates in subsequent studies were as high as 44%. In 1984, Gopal et al published a study with describing an anterior levatorplasty added to the Altemeier repair. They had a one recurrence in 18 patients (6%). In 1994, **Ramanujam et al[23]** described a posterior levatorplasty. They had a recurrence rate of 6%. The largest subsequent study looking at perineal rectosigmoidectomy was **Chun et al[24]** with 120 patients and they reported a 16% recurrence. Recurrence after rectal prolapse surgery (abdominal or perineal) can be corrected by perineal rectosigmoidectomy.

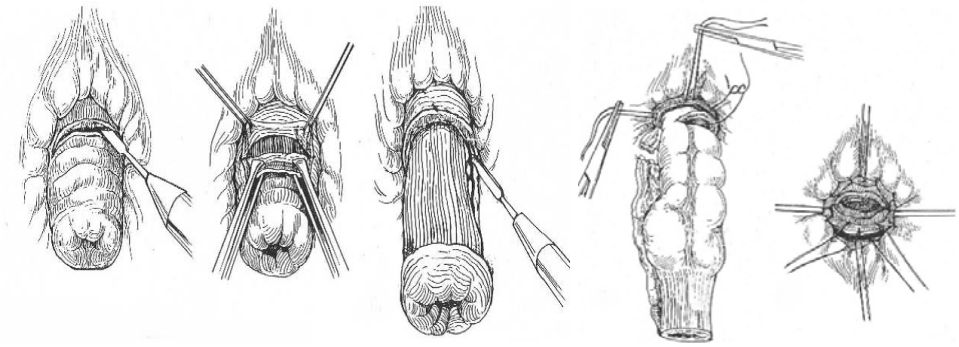


FIGURE 9: PERINEAL RECTOSIGMOIDECTOMY

Abdominal approach:

It is the preferred method in young patients and patients who are not under high risk as it requires extensive bowel dissection followed by fixation.

They are classified according to the type of dissection and method of fixation of rectum.

A) Rectopexy:

- **Suture rectopexy:** It is the most basic method among abdominal procedures developed by **Cutait**[25] in 1959. In this method the prolapsed rectum is pulled up adequately and fixed to the sacrum using a non-absorbable suture. The recurrence rate is approximately 3% (0- 27%)

- **Prosthetic rectopexy:** It is based on the principle that presence of a prosthetic material triggers adhesion due to fibrosis thus fixing the rectum firmly to the sacrum preventing prolapse. Fascia lata, prolene, marlex, ivalon sponge, prolene tapes have been used in prosthetic rectopexy.

  It consists of two types:

  - Anterior sling rectopexy (Ripstein procedure)
  - Posterior prosthetic rectopexy

1. **Anterior sling rectopexy (Ripstein procedure)[3]:** First described in 1952. After mobilization of the rectum is undertaken, a mesh is fixed to the anterior wall of the rectum at the level of the peritoneal reflection. Has the advantage of low recurrence rates: 0-9.6%. Has the disadvantage of high rate of complications: up to 52%. One of the more disastrous complications is mesh erosion into the rectum.

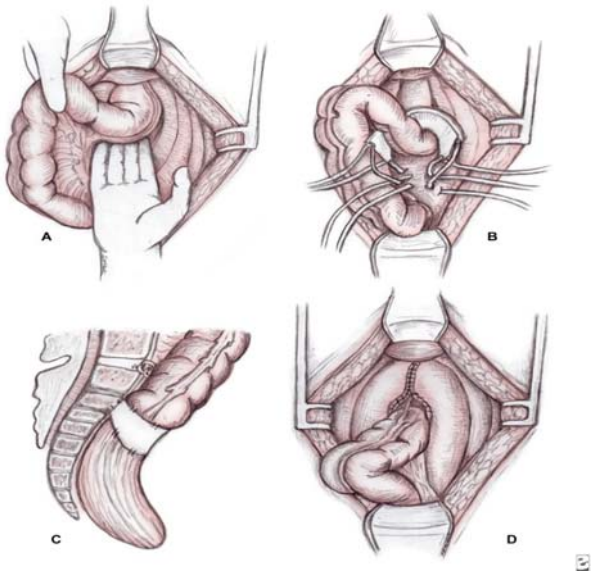


FIGURE 10: RIPSTEIN'S PROCEDURE

2. **Posterior prosthetic rectopexy:**In this method a prosthetic material is kept between the rectum and the sacrum and rectum is fixed to the sacrum firmly.**Wells**[26]described a method of posterior prosthetic rectopexy using **Ivalon Sponge** in the year 1959. In this method recurrence is seen in approximately 3% patients and mortality is approximately1-2%. Recently, surgeons have abandoned the use of Ivalon in favour of other meshes, both absorbable and nonabsorbable

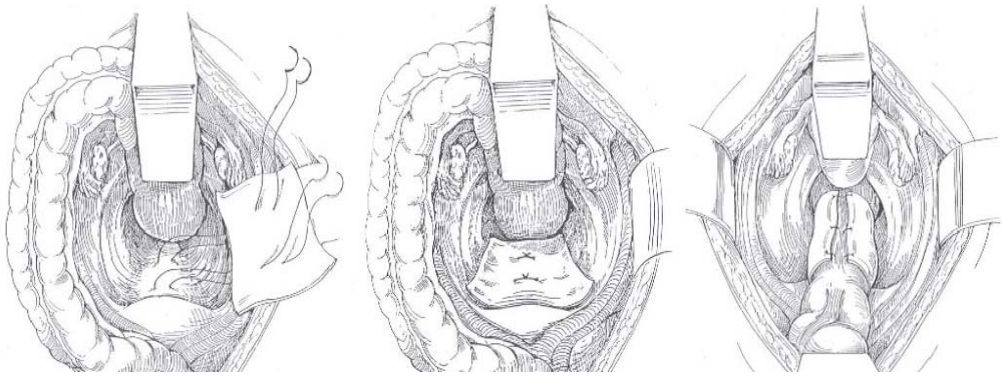


FIGURE 11: WELL'S POSTERIOR PROSTHETIC RECTOPEXY

B) **Resection & fixation:**This is based on the principle that the anastomosis after resection of the redundant sigmoid colon adheres tightly to the sacrum. Constipation also gets cured at the same time in some patients due to removal of the redundant sigmoid. Complications like volvulus and strangulation is also prevented. Postoperative mortality is about 6.5%, and the recurrence is about 5%.

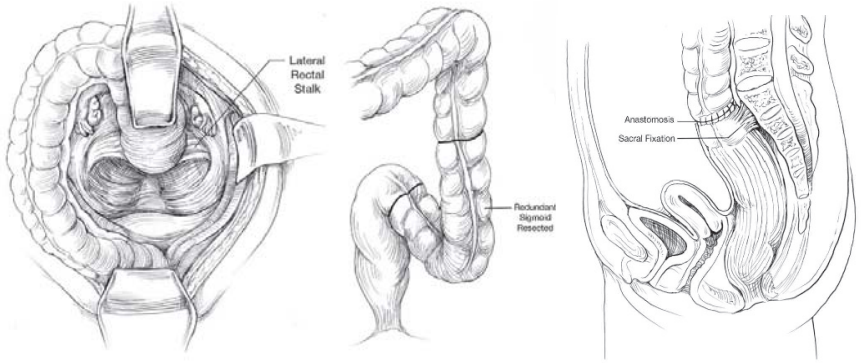


FIGURE 12: RESECTION AND FIXATION

C) Laproscopic procedures: Laproscopic rectal prolapse repair has come into vogue in recent years as a number of surgeons gained expertise in laproscopic procedures. The steps of laproscopic repair is similar to abdominal procedure with the advantage being early recovery, shorter hospital stay, early return to work, better cosmetic results. Various studies[27, 28] show equivalent outcomes in both laproscopic and abdominal rectal prolapse repair.

Treatment	Advantages	Disadvantages
Abdominal		
Anterior resection	Low recurrence	Resection required
Ripstein mesh sling	No resection	Impaction, constipation, foreign body
Well's Ivalon sponge	No resection	Constipation persists, foreign body
Orr-Loygue	No resection	Constipation persists
Sigmoid colectomy with suture rectopexy	Low recurrence	Resection required
Perineal		
Altemeier (perineal rectosigmoidectomy)	Low morbidity/mortality, low recurrence	General/regional anesthesia, continued incontinence, anastomosis
Altemeier with levatorplasty	Low morbidity/mortality, low recurrence, incontinence improved	General/regional anesthesia, anastomosis
Delorme procedure	Low morbidity/mortality, local anesthesia	High recurrence rates, continued incontinence
Thiersch anal encirclement	Low morbidity/mortality, local anesthesia	Fecal impaction, infection, wire breakage, erosion

FIGURE 13: ADVANTAGES AND DISADVANTAGES OF VARIOUS PROCEDURES FOR RECTAL PROLAPSE

MATERIALS AND METHODS

AIMS & OBJECTIVES

1. The main aim of the study is to identify the possible causative factors, mode of presentation and complications of rectal prolapse.

2. To evaluate the effects of various operative procedures for rectal prolapse and their complications.

The study was conducted at Government Stanley Medical College and Hospital,Department of General Surgery, Chennai between May 2010 and October 2012by a retrospective and a prospective analysis of the patients who were admitted with rectal prolapse.

INCLUSION CRITERIA:

1. All patients with rectal prolapse, both partial and complete, who underwent surgery by any method, were included in the study.

EXCLUSION CRITERIA:

1. Patients who refused to undergo a complete clinical evaluation and surgery were excluded from the study
2. Patients who did not report for a minimum of 6 months follow up.

METHODOLOGY:

30 patients who presented with partial or complete prolapse were included in the study.

The study design is as follows

1. All patients were subjected to detailed history taking and physical examination including proctoscopy.

2. Basic investigations like complete blood counts, bleeding time, clotting time and renal function tests, cardiac evaluation by ECG and echocardiography, and a Chest X ray if clinically warranted were done in all cases.

3. Abdominal USG or CECT abdomen to rule out any other intra-abdominal pathology, colonoscopy or sigmoidoscopy for intra luminal causes of rectal prolapse were done in all patients.

4. All patients were subjected to appropriate surgery and were monitored closely in the post-operative period and were regularly followed up at the end of 1^{st}, 2^{nd}, 4^{th}, 6^{th} month and every 3 months later with a detailed history, clinical examination and per rectal examination each time.

5. The details were recorded in a pre-designed proforma which was later analysed.

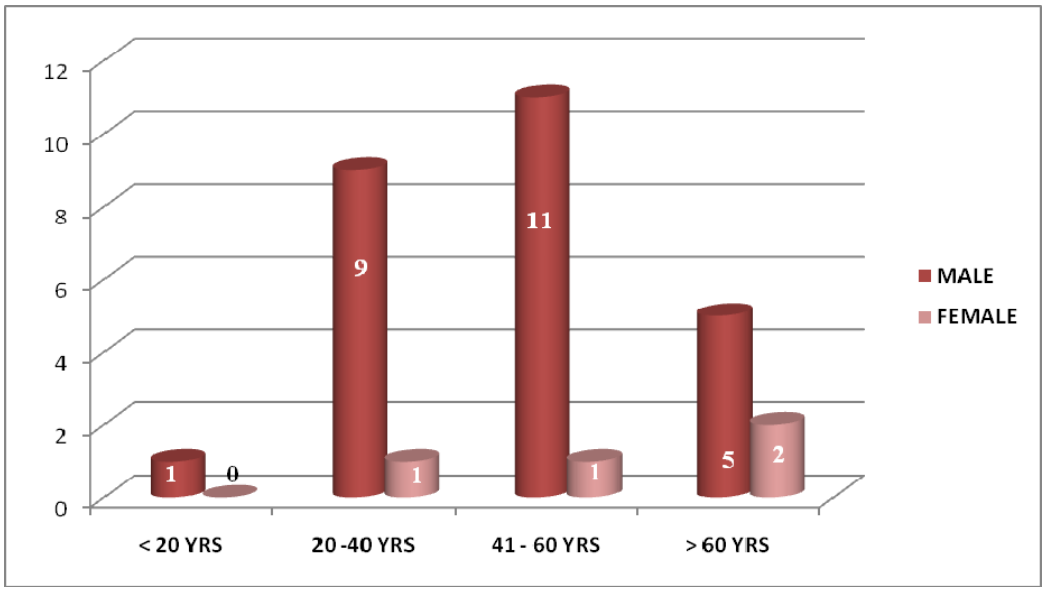
RESULTS

A total of 30 cases comprised the study group.

AGE DISTRIBUTION:

AGE GROUP	NO. OF PATIENTS	PERCENTAGE
< 20 YRS	1	3.3%
20 – 40 YRS	10	33.3%
41 – 60 YRS	12	40%
> 60 YRS	7	23.4%

TABLE 1: AGE DISTRIBUTION



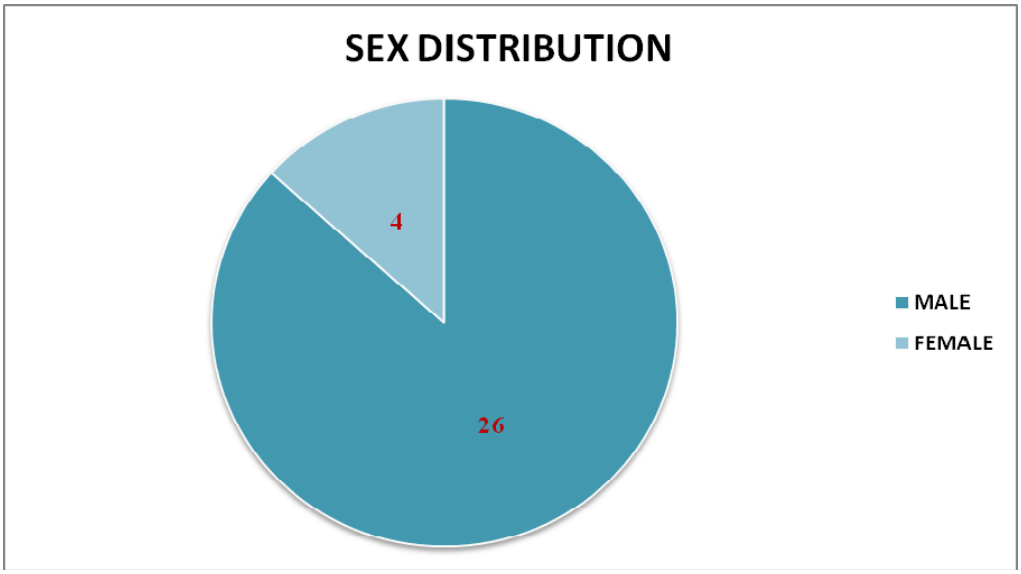
GRAPH 1: AGE DISTRIBUTION

Average age of presentation was 46.5yrs (Range: 19 – 75yrs). A majority of the patients were in the age group of 41 – 60 years (40%) followed by 20 – 40yrs age group (33.3%).

SEX DISTRIBUTION:

SEX	NO OF PATIENTS	PERCENTAGE
MALE	26	67%
FEMALE	4	13%

TABLE 2: SEX DISTRIBUTION



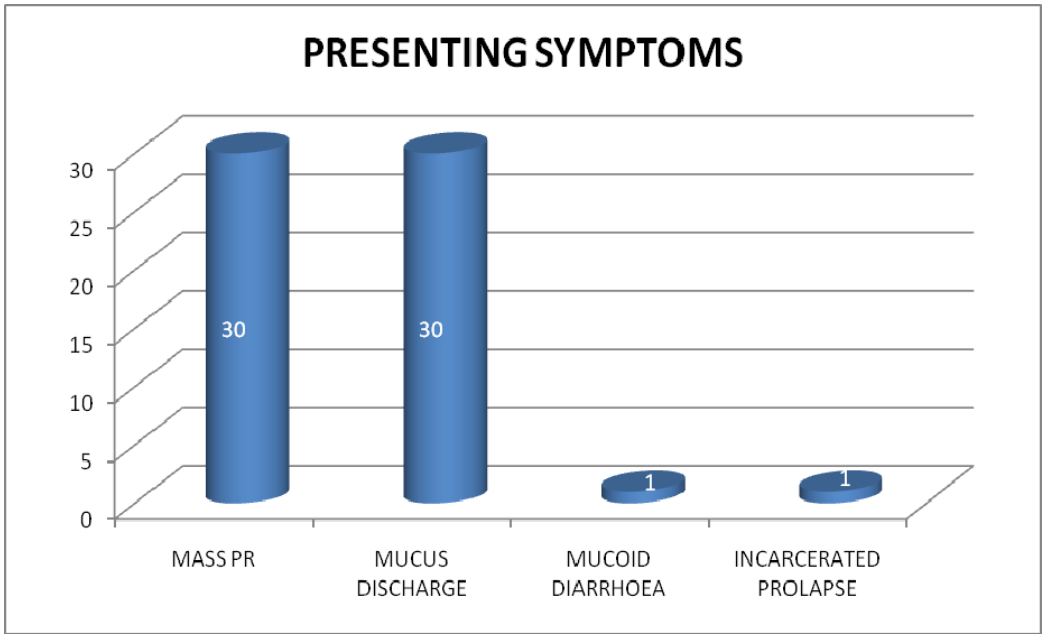
GRAPH 2: SEX DISTRIBUTION

Males comprised the majority of the patients (67%) with only 4 females (13%) in the study group.

PRESENTING SYMPTOMS:

SYMPTOM	NO OF CASES	PERCENTAGE
MASS PR	30	100%
MUCUS DISCHARGE	30	100%
MUCOID DIARRHOEA	1	3.3%
INCARCERATED PROLAPSE	1	3.3%

TABLE 3: PRESENTING SYMPTOMS



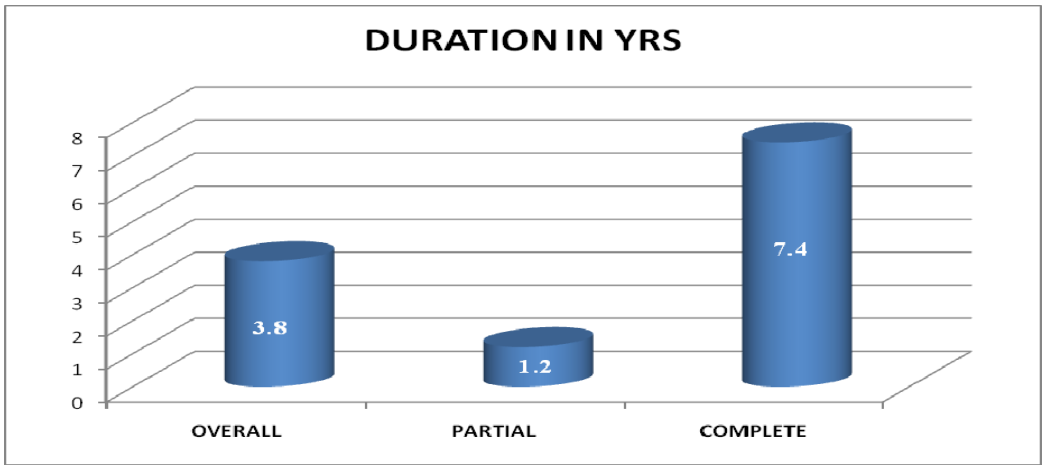
GRAPH 3: PRESENTING SYMPTOMS

Mass descending per rectum and mucoid discharge per rectum was present in 100% patients. Five patients (16%) presented with mass descending per rectum with bleeding per rectum. One patient presented with mucoid diarrhoea (3%). Only one patient presented with incarcerated rectal prolapse.

MEAN DURATION OF PROLAPSE:

TYPE OF PROLAPSE	MEAN DURATION
PARTIAL	1.2 YRS
COMPLETE	7.4 YRS
OVERALL	3.8 YRS

TABLE 4: MEAN DURATION OF PROLAPSE



GRAPH 4: MEAN DURATION OF PROLAPSE

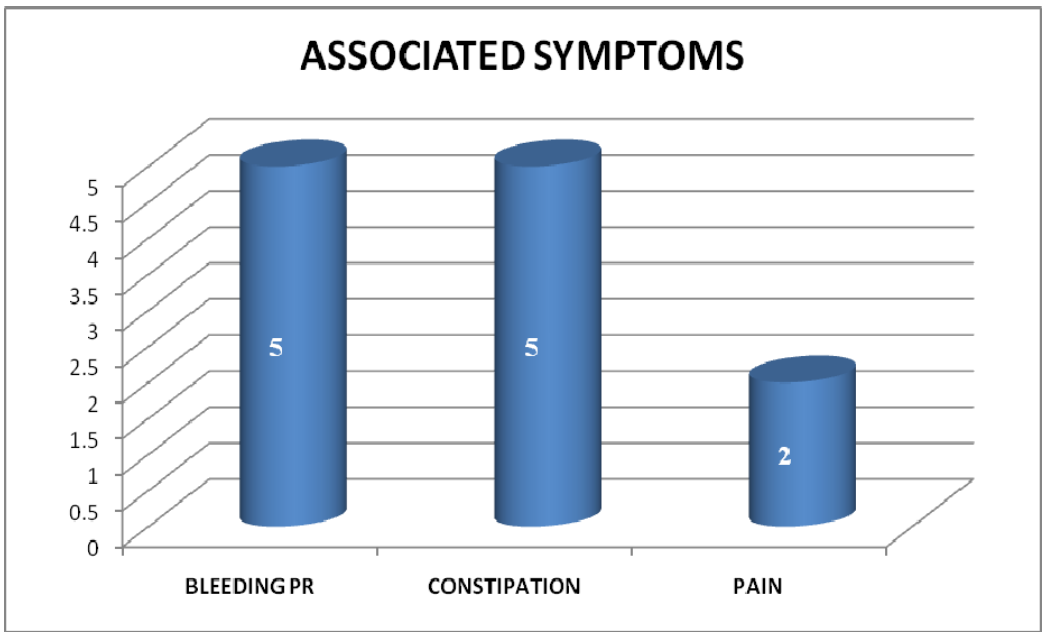
Overall mean duration of prolapse was 3.8yrs (Range: 1 month - 15yrs) with the mean duration of partial prolapse being 1.2yrs (Range: 1 month - 2yrs) and complete prolapse being 7.4yrs (Range: 6 months-15yrs).

ASSOCIATED SYMPTOMS:

Pain was present in 2patients (6%), bleeding PR in 5 patients (16%),and constipation in 5 patients (16%).

SYMPTOMS	NO OF PATIENTS	PERCENTAGE
BLEEDING PR	5	16%
CONSTIPATION	5	16%
PAIN	2	6%

TABLE 5: ASSOCIATED SYMPTOMS



GRAPH 5: ASSOCIATED SYMPTOMS

PREVIOUS HISTORY OF PERINEAL SURGERY:

One patient underwent lateral sphincterotomy for fissure in ano followed which he developed complete rectal prolapse one year later, for which he underwent Delorme's procedure 6yrs back. But the patient developed recurrence 2yrs later.

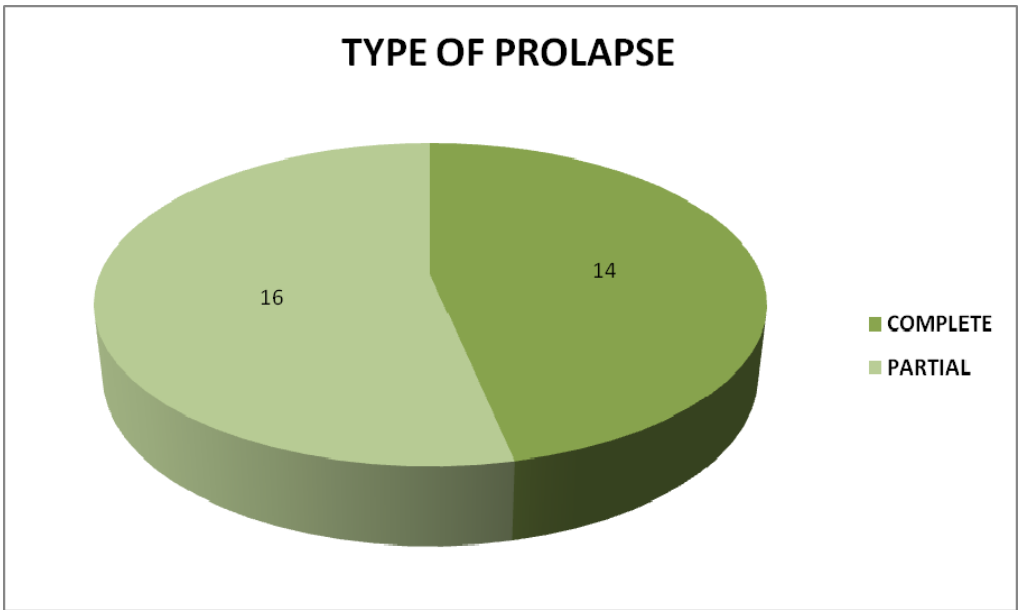
One patient underwent hemorrhoidectomy 20yrs before, 5yrs later he developed rectal prolapse. One patient had history of complete perineal tear during her 3rd pregnancy, 30yrs back which was repaired in a hospital.

PAST HISTORY:

One patient had history of Acute Diarrhoeal Disease (ADD) with severe dehydration, treated in a hospital. Another patient had history of malaria followed by severe weight loss.

CLINICAL EXAMINATION:

TYPE OF PROLAPSE:



GRAPH 6: TYPE OF PROLAPSE

Partial prolapse was found in 16 patients (53%) and complete prolapse in 14 patients (47%).

All the prolapses were reducible except one patient who presented with incarcerated prolapse.

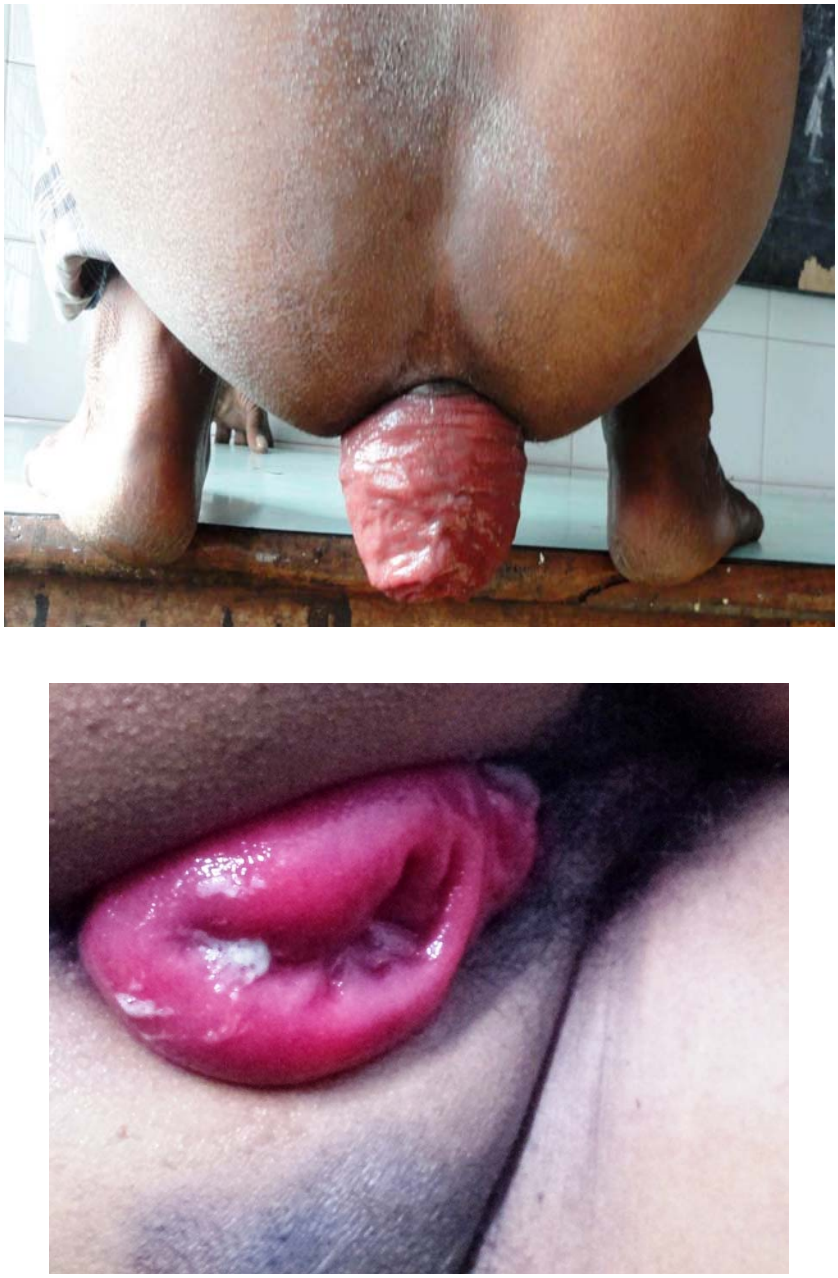


FIGURE 14: COMPLETE RECTAL PROLAPSE

Examination of complete rectal prolapse reveals presence of circular folds of mucosa on the prolapsed rectum. A grove will be present between the prolapsed rectum and the anus which will be absent in case of prolapsed haemorrhoids.

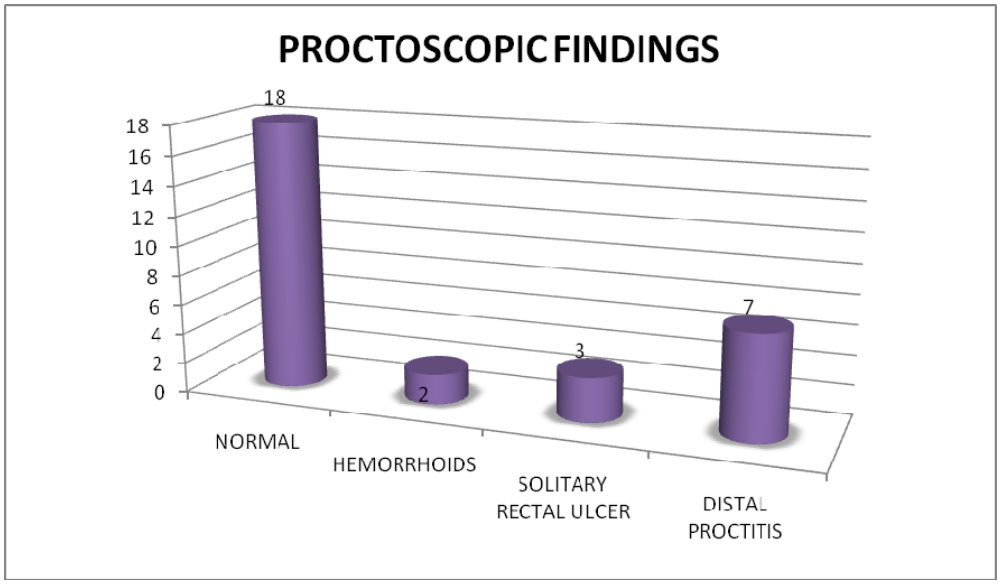
FIGURE 15: INCARCERATED COMPLETE RECTAL PROLAPSE

This is a picture showing the incarcerated prolapse. Note the edematous prolapse with few ulcers on the prolapsed rectum.

FIGURE 16: PARTIAL PROLAPSE

Partial prolapse can be differentiated from a complete prolapse by the fact that partial prolapse contains only two layers of prolapsed mucosa while a complete prolapse contains four layers, two each of prolapsed mucosa and muscular layers.

PROCTOSCOPIC FINDINGS:

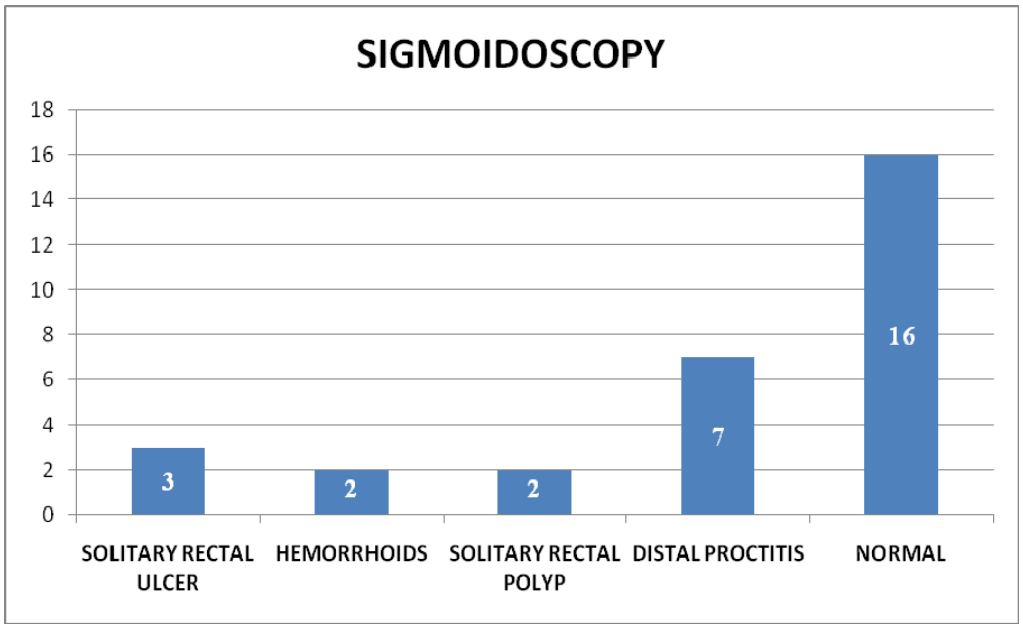


GRAPH 7: PROCTOSCOPIC FINDINGS

Proctoscopy showed haemorrhoids in two patients (6.6%), solitary rectal ulcer over the anterior wall in three patients (10%), distal proctitis in 7 patients (23.4%). Rest of the patients (60%) had normal findings.

All the patients were subjected to basic investigations which were found to be normal.

SIGMOIDOSCOPIC FINDINGS:



GRAPH 8: SIGMOIDOSCOPIC FINDINGS

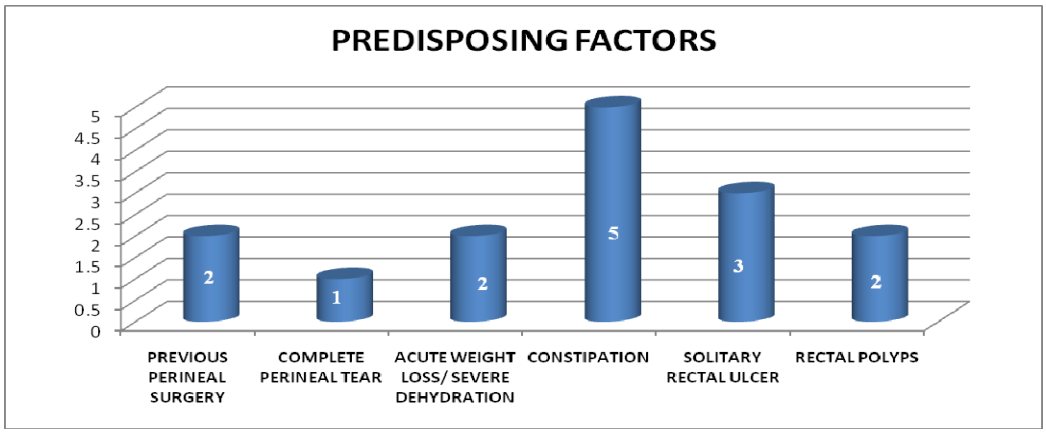
Sigmoidoscopy showed haemorrhoids in two patients (6.6%), solitary ulcer in three patients (10%), and distal proctitis in 7 (23.4%) patients. Solitary pedunculated polyps were present in two patients (6.6%), both of whom were cases of complete prolapse. Both the patients underwent endoscopic polypectomy and the histopathological examination showed them to be benign.

USG / CECT were done in all patients who were found to be normal.

PREDISPOSING FACTORS:

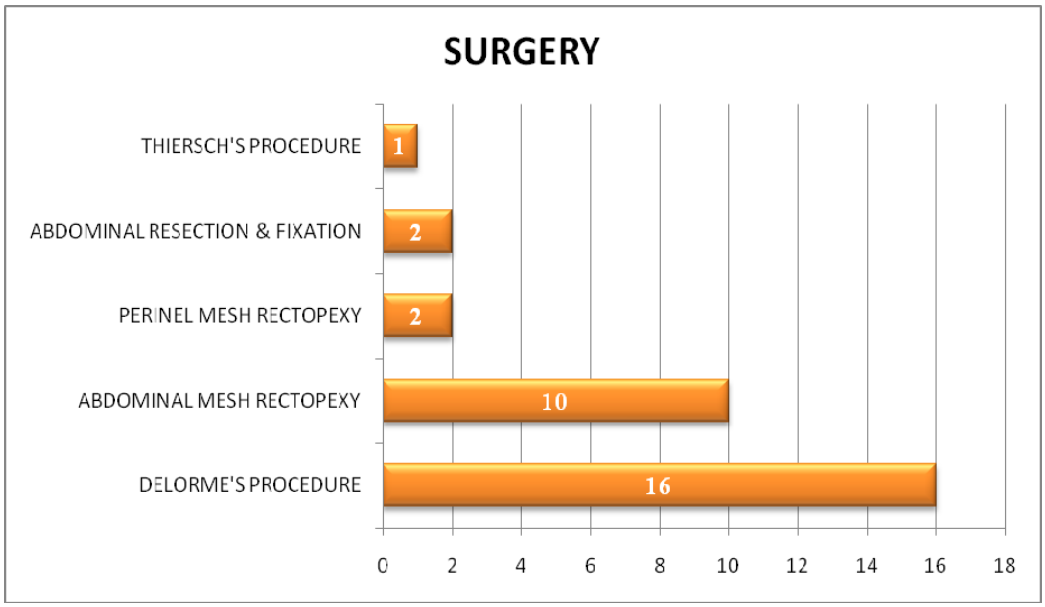
PREDISPOSING FACTOR	NO OF PATIENTS	PERCENTAGE
PREVIOUS PERINEAL SURGERY	2	6.6%
COMPLETE PERINEAL TEAR	1	3.3%
ACUTE WEIGHT LOSS/ SEVERE DEHYDRATION	2	6.6%
CONSTIPATION	5	16.6%
SOLITARY RECTAL ULCER	3	10%
RECTAL POLYPS	2	6.6%

TABLE 6: PREDISPOSING FACTORS



GRAPH 9: PREDISPOSING FACTORS

SURGICAL MANAGEMENT:



GRAPH 10: SURGICAL MANAGEMENT

All the patients with partial prolapse underwent Delorme's procedure under subarachnoid block. Among the patients with complete prolapse, 9 patients underwent abdominal mesh rectopexy, two patients underwent perineal mesh rectopexy, and two underwent abdominal resection and fixation. One patient who presented with irreducible prolapse was subjected for emergency reduction under GA followed by Thiersch's procedure. Once the general condition of the patient improved, he was subjected for abdominal mesh rectopexy.

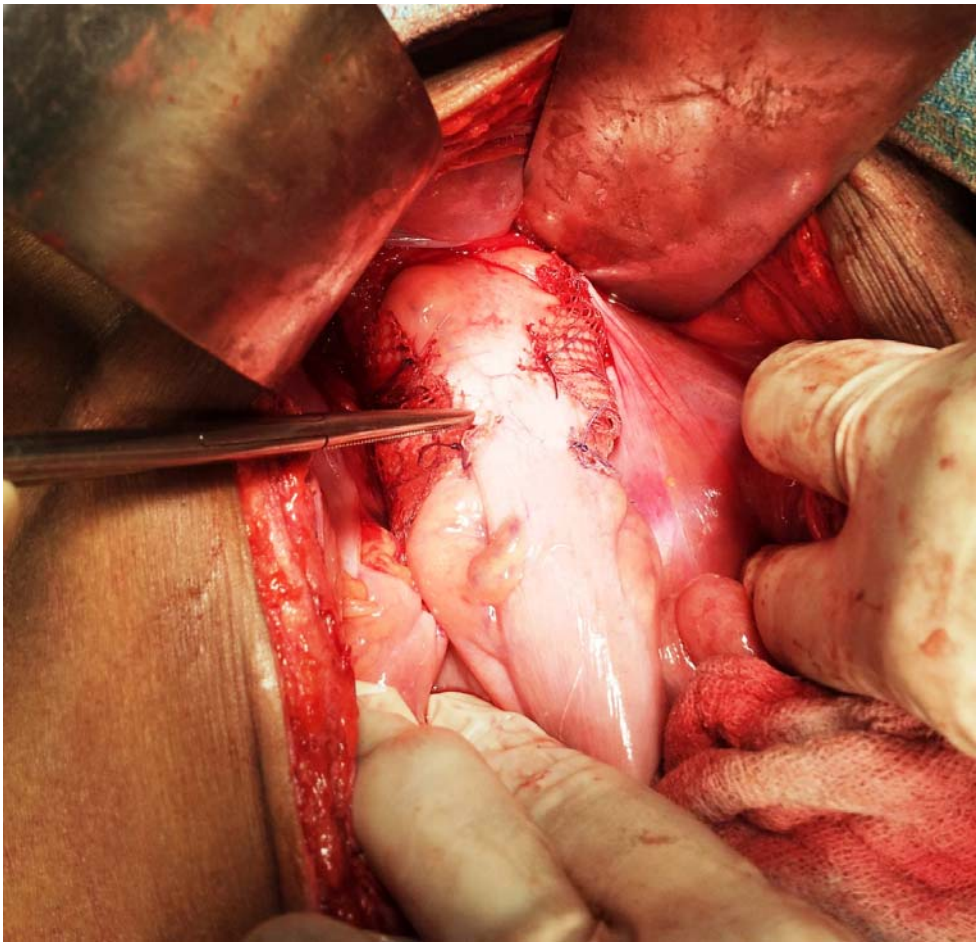


FIGURE 17: ABDOMINAL MESH RECTOPEXY

After complete mobilisation of the rectum, a non-absorbable mesh is fixed to the sacrum and wrapped around the circumference of the rectum, leaving 2 –3cm gap anteriorly, and fixed to it.

HOSPITAL STAY:

Mean duration of hospital stay was 6 days. Patients who underwent a perineal procedure (18 patients) had a mean hospital stay of 3.8days and those who underwent abdominal procedure had a mean hospital stay of 9.2 days.

	MEAN DURATION IN DAYS
OVERALL	6
ABDOMINAL PROCEDURE	9.2
PERINEAL PROCEDURE	3.8

TABLE 7: DURATION OF HOSPITAL STAY

POST-OPERATIVE COMPLICATIONS:

Two patients developed prolonged post-op paralytic ileus, one in a patient who underwent abdominal mesh rectopexy and another in a patient who underwent resection and fixation. Both the patients improved on conservative management of paralytic ileus.

One patient developed wound infection which was treated with appropriate antibiotics. None of the patients developed incontinence.

Mean duration of follow up was 8 months.

Constipation:

Out of 4 patients who presented with constipation, 3 patients did not complain of constipation in post-operative period, whereas constipation persisted in one patient. Two patients developed constipation in post-operative period which improved after treatment.

	NO. OF PATIENTS
PREOPERATIVE CONSTIPATION	4
POSTOPERATIVE CONSTIPATION	3
ONSET OF CONSTIPATION POST SURGERY	2
PERSISTENT CONSTIPATION	1

TABLE 8: NO OF PATIENTS WITH CONSTIPATION

Recurrence:

Only one patient developed recurrence. Patient had undergone a perineal mesh fixation, but the prolapse recurred after 6 months. Hence the patient was subjected for abdominal resection and mesh fixation procedure. Patient is on follow up for the past 4 months without any complaint.

POST-OPERATIVE COMPLICATIONS:

COMPLICATION	NO. OF PATIENTS	PERCENTAGE
HEMORRHAGE	NIL	0
PROLONGED POST OP ILEUS	2	6%
MESH INFECTION	NIL	0
WOUND INFECTION	1	3%
CONSTIPATION	3	10%
INCONTINENCE	NIL	0
RECURRENCE	1	3%
MORTALITY	NIL	0

TABLE 9: POST OPERATIVE COMPLICATIONS

DISCUSSION

In the present study, majority of patients were in the age group of 41 – 60yrs (40%). We did not encounter any pediatric case during our study period[13].

With respect to the sex predominance, western studies show predominant involvement of female population with a female to male ratio of 6:1[36], whereas our study has a predominant male population (male : female –6.5 : 1), which is on par with the studies from India and Other Asian countries, the probable reason being under-reporting of female population in Indian subcontinent.[36, 37, 38].

We encountered almost equal incidence of both partial and complete rectal prolapse, which accounted for 53% and 47% respectively.

Mass descending per rectum and mucoid discharge per rectum were complained by all the patients which is similar to other studies. Bleeding per rectum (16.6%) and mucoid diarrhoea (3%) was present in a minority of patients. One patient presented with incarcerated rectal prolapse which is a surgical emergency.

Incontinence to stools / flatus has been reported as a presenting symptom in various studies ranging from 30 – 80%, but we did not have any patient presenting with incontinence[36].

Etiology of prolpase could not be identified in majority of our patients. Constipation, which is one of the commonest predisposing causes of rectal prolapse, was present in only 16% of cases in our study.

Previous anorectal surgeries/ perineal surgeries have been proposed to be one of the predisposing factors for rectal prolapse. In our study we had one patient who underwent lateral sphincterotomy following which he developed rectal prolapse for which he underwent Delorme's procedure, but he developed recurrence of prolapse two years later and presented to us. One more patient had undergone hemorrhoidectomy 20 years back. One elderly female had history of complete perineal tear repair.

Severe dehydration or acute weight loss which are also the predisposing factors were present in two cases in our study.

Partial prolapse had a shorter duration of symptoms (1.2yrs) when compared to complete prolapse (7.4yrs).

Proctoscopy was normal in majority of patients (60%). Abnormal findings noted were those associated with prolapse like Solitary rectal ulcer (10% cases), haemorrhoids (6.6%), and distalproctitis (23.4%).

Sigmoidoscopy is mandatory in all patients of rectal prolapse to rule out any intraluminal causes of prolapse. Sigmoidoscopy showed findings similar to proctoscopy, in addition, two patients showed presence of solitary rectal polyp which might be a cause of rectal prolapse. Both the patients underwent endoscopic polypectomy and specimens were benign in nature.

Imaging studies of abdomen were done to rule out intra-abdominal causes which were found to be normal in all the patients.

Delorme's procedure is the preferred surgical method for partial rectal prolapse due to the ease of the procedure, less convalescent period and less postoperative morbidity. All the patients of partial rectal prolapse in our study were subjected to Delorme's procedure.

In concern with the cases with complete prolapse, the choice of surgical procedure was based on the length of prolapsed rectum, duration of symptoms, the age of the patient and most importantly the choice of the patient.

Abdominal mesh rectopexy, being the most commonly practiced procedure throughout the world, was the most commonly used procedure in the present study. Thiersch's procedure, being reserved only for elderly patients, was used as a temporary procedure in one of the patients who presented with incarcerated rectal prolapse. The patient underwent abdominal mesh rectopexy later.

The mean duration of hospital stay was relatively less in patients undergoing perineal procedures when compared to the abdominal procedures, owing to the absence of large abdominal wound in perineal surgeries thus lessening the recovery time.

Prolonged postoperative ileus is a well-documented complication in the early postoperative period in abdominal procedures due to the bowel handling. It was present in only two patients (12.5%) which were treated conservatively.

Wound infection was also documented in only one patient (6.3%) who was treated with appropriate antibiotics.

None of the patients developed incontinence in the postoperative period.

Abdominal rectopexy is known to cause constipation in 10 – 47% according to various studies[36, 37]. In our study, preoperative constipation improved in 75% patients whereas 6.7% patients developed constipation postoperatively which subsided after medical management.

Recurrence rates according to various studies ranges from 0 – 5%[32, 33, 34], based on the type of procedure done. In our study only one patient who underwent perineal mesh rectopexy developed recurrence after 6 months accounting an overall recurrence rate of 3.3%.

There was no mortality observed in the present study.

COMPARISON OF RESULTS AFTER PERINEAL SURGERIES[22, 29, 30, 31, 35]:

Sl No	Author	Procedure	No. Of patients	Recurrenc (%)	Mortality (%)
1	OLIVER, et al	DELORME	41	8.0	1.0
2	LIBERMAN, et al	DELORME	34	0	0
3	BYUN, et al	DELORME	29	3.4	0
4	ALTEMEIER	ALTEMEIER	106	3.0	0
5	KIM, et al	ALTEMEIER	183	29	0
6	K. HAMMOND et al	DELORME, ALTEMEIER	62	13.3	1.3
7	CHOW	DELORME	9	0	0
8	PRESENT STUDY	DELORME, PERINEAL MESH RECTOPEXY	18	5%	0

TABLE 10: COMPARISON OF RESULTS AFTER PERINEAL SURGERIES

COMPARISON OF RESULTS AFTER ABDOMINAL SURGERIES[31, 32, 33, 34, 35]:

SL NO	Author	Procedure	No of patients	Recurrence (%)	Mortality (%)
1	SCHULTZ	RIPSTEIN'S PROCEDURE	69	2	0
2	AITOLA	POSTERIOR MESH RECTOPEXY	96	6	1
3	MOLLEN	POSTERIOR MESH RECTOPEXY	18	0	NOT STATED
4	KIM	RESECTION WITH SUTURE RECTOPEXY	176	5.0	NOT STATED
6	K HAMMOND	POSTERIOR RECTOPEXY, RESECTION AND RECTOPEXY	8	12.5	0
7	CHOW	RESECTION AND RECTOPEXY	8	12.5	0
8	PRESENT STUDY	POSTERIOR MESH RECTOPEXY, RESECTION AND RECTOPEXY	14	0	0

TABLE 11: COMPARISON OF RESULTS AFTER ABDOMINAL SURGERIES

CONCLUSION

Rectal prolapse is a distressing condition, pathophysiology of which is unknown. Etiological factors could not be identified in most of the cases even after the use of all the available investigations.

Most common presenting symptom is mass descending per rectum with mucus discharge.

Incarcerated prolapse, though rare, is a dreaded complication in rectal prolapse due to the considerable morbidity and mortality.

Careful consideration of the patient's information and surgeon's experience is required before choosing the appropriate procedure. In general, perineal procedures have shorter duration of hospital stay, less morbidity and early return to normal activity when compared to the abdominal procedures, but, the recurrence rates are generally high when compared to abdominal procedures.

Before choosing any treatment strategy for rectal prolapse, attention must also be paid to the functional outcome like quality of life and continence.

SUMMARY

The study comprised of 30 cases of rectal prolapse admitted at The Govt. Stanley Medical College and Hospital, between May 2010 to October 2012 and who underwent surgery for the same by any method.

- There was a male predominance in the ratio of 6.5 :1
- Majority of the patients (40%) were in the age group of 41 – 60yrs, with mean age of presentation of 46.5yrs.
- All patients presented with mass per rectum and mucus discharge per rectum
- 16% of the patients had constipation while none of them presented with incontinence to stools.
- The incidence of partial and complete prolapse were almost equal (53% - partial prolapse, 47%-complete prolapse)
- Majority of the patients (53%) had normal findings on sigmoidoscopy.
- All the patients of partial prolapse underwent Delorme's procedure.
- Among the patients with complete prolapse, 9 patients underwent abdominal mesh rectopexy, 2 patients underwent perineal mesh rectopexy, and 2 underwent abdominal resection and fixation. One patient who presented with irreducible prolapse was subjected for emergency reduction under GA followed by Thiersch's procedure followed by elective abdominal mesh rectopexy.

- Patients undergoing perineal procedures had a shorter hospital stay when compared to those undergoing abdominal procedures.
- None of the patients had significant postoperative complication like mesh infection, haemorrhage, incontinence etc.
- Only one patient developed recurrence (3.3%).

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PROFORMA

- NAME : SL. NO:
- AGE /SEX:
- ADDRESS WITH CONTACT NUMBER:
- IP NO:
- DATE OF ADMISSION:
- DATE OF SURGERY:
- DATE OF DISCHARGE:

HISTORY OF PRESENTING ILLNESS:

- MASS PER RECTUM:
    - Onset-
    - Duration-
    - Progress-
    - Persistent or intermittent-
    - Any increase in size of the swelling during straining-
- PAIN:
    - Site-
    - Duration-
    - Nature-
    - Aggravating/relieving factors-
- DISCHARGE FROM THE ANUS, IF ANY:
- BLEEDING PER RECTUM, IF ANY:

PAST HISTORY:

WHETHER A KNOWN CASE OF DM/HYPERTENSION/ASTHMA/TB/EPILEPSY/CARDIAC ILLNESS

H/O SIMILAR EPISODES IN THE PAST, IF ANY:

H/O ANAL/RECTAL SURGERIES IN THE PAST, IF ANY:

H/O TRAUMA TO PERINEAL REGION IN THE PAST, IF ANY

H/O MAJOR ILLNESS/ HOSPITAL ADMISSIONS, IF ANY

PERSONAL HISTORY:

Whether a smoker or an alcoholic,

FAMILY HISTORY:

TREATMENT HISTORY:

<u>CLINICAL EXAMINATION:</u>

GENERAL EXAMINATION:

SYSTEMIC EXAMINATION:

CVS

RS

PER ABDOMEN

CNS

LOCAL EXAMINATION:

- **PROLAPSE:**

  Length

  Partial / Complete

Reducible / Not

Any associated Ulcer / Hemorrhoids visible over the Prolapse

- **Proctoscopy / Digital Rectal Examination**

CLINICAL DIAGNOSIS:

INVESTIGATIONS:

- COLONOSCOPY
- CECT ABDOMEN & PELVIS:
- ROUTINE INVESTIGATIONS(CBC,RFT,CXR,ECG)
- OTHER INVESTIGATIONS(IF ANY):

FINAL DIAGNOSIS:

SURGERY DONE:

POST OPERATIVE COMPLICATIONS, IF ANY:

FOLLOW UP:

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INSTITUTIONAL ETHICAL COMMITTEE, STANLEY MEDICAL COLLEGE, CHENNAI-1

Title of the Work : A study on Etiological factors and outcome of rectal prolapse

Principal Investigator : Dr.R.M.Aravind

Designation : PG in M.S (GS)

Department : Department of General Surgery
Government Stanley Medical College,
Chennai-1

The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 06.03.2012 at the Council Hall, Stanley Medical College, Chennai-1 at 2PM

The members of the Committee, the secretary and the Chairman are pleased to approve the proposed work mentioned above, submitted by the principal investigator.

The Principal investigator and their team are directed to adhere to the guidelines given below:

1. You should inform the IEC in case of changes in study procedure, site investigator investigation or guide or any other changes.
2. You should not deviate from the area of the work for which you applied for ethical clearance.
3. You should inform the IEC immediately, in case of any adverse events or serious adverse reaction.
4. You should abide to the rules and regulation of the institution(s).
5. You should complete the work within the specified period and if any extension of time is required, you should apply for permission again and do the work.
6. You should submit the summary of the work to the ethical committee on completion of the work.

29/10/12.

MEMBER SECRETARY,
IEC, SMC, CHENNAI